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store in the coal less than three parts in a thousand ultimately become useful. In the last six years, however, some hint of means to overcome this difficulty has been obtained from the proof by Maxwell and Hertz that light is only an electric radiation. Could we produce electric oscillations of a sufficient rapidity we might discard the molecules of matter and directly manufacture light without their intervention. To effect this we must be able to produce oscillations at the rate of five hundred billions per second. Tesla has produced them in thousands and millions per second, and Crookes has shown how by means of high vacua to raise many bodies to brilliant fluorescence at a small expense of energy." Illustrations of these processes having been given, the lecturer concluded: "These are hints toward a solution of the problem, but give no solution as yet. Professor Langley states that the Cuban firefly spends the whole of its energy upon the visual rays without wasting any upon heat, and is some four hundred times more efficient as a light producer than the electric arc, and even ten times more efficient than the sun in this respect. Thus while at present we have no solution of these important problems we have reason to hope that in the not distant future one may be obtained, and the human inventor may not be put to shame by his insect rival."

At the general final meeting on Friday (17th inst) it was moved by Dr. Sanford Fleming, C. M. G., of Ottawa, and seconded by Sir William Dawson, F. R. S., that the Royal Society of Canada was of opinion that it is in the interests of science and seamen in all parts of the world that a final determination be speedily reached regarding the unification of the nautical, astronomical and civil days, so that all may begin everywhere at midnight, and that as the proposal can with least difficulty be carried into effect on January 1st, 1901, the Council

be requested in the name and on behalf of the Society to adopt such measures as may be considered expedient to bring about the desired result. This is a subject to which Dr. Sanford Fleming has devoted much and fruitful attention.

The following officers were elected for the ensuing year: President, Dr. R. S. C. Selwyn, C. M. G., F. R. S., ex-Director of the Geological and Natural History Survey; Vice-President, the Archbishop of Halifax, Dr. O'Brien; Secretary, Dr. J. G. Bourinot, C. M. G.; Treasurer, Prof. J. Fletcher. Prof. Bovey, Dean of the Faculty of Applied Science, McGill University, was chosen president of the third section; Prof. Dupuis, of Queen's College, Kingston, Ont., Vice-President, and Capt. E. Deville, Surveyor-General of the Dominion, Secretary. In the fourth section, the following choice was made: President, Prof. Wesley Mills, M. A., M. D., McGill University; Vice-President, Prof. Penhallow, B. Sc., of the same institution; Secretary, Dr. Burgess, Superintendent of the Protestant Insane Asylum, Verdun, near Montreal. J. T. C.

#### CORRESPONDENCE.

##### VOLCANIC DUST IN UTAH AND COLORADO.

SCIENCE of April 26th contains an article by H. W. Turner, of Washington, D. C., upon '*Volcanic Dust in Texas.*' It may perhaps be of interest to some of the readers of SCIENCE to learn that large deposits of volcanic dust occur in Utah, and also in the extreme northwestern portion of Colorado. In the year 1890, while I was a professor in the University of Utah, my attention was called to an extensive deposit of a grayish-white substance near Stockton in the Oquirrh range of mountains, some sixty miles southwest of Salt Lake City, by Mr. Ben Johnson of that place. Upon examination I found it to consist almost wholly of microscopic, transparent, siliceous flakes of various, irregular forms, one of the most common be-

ing curved and nearly triangular. When put into pure water, it invariably showed a slight acidity, reddening blue litmus paper. It can be taken from the deposit in lumps; but they readily fall to powder, the particles or flakes becoming separated by the pressure of one's hand. During a tour through southern Utah in the year 1893 I found another large deposit of the same kind of volcanic product on the east side of the Wasatch Mountains in the vicinity of Monroe village, in Sevier county. I could find no difference between this latter and that which occurs near Stockton. Both give a slight acid reaction, which, I suspect to be due to a sulphur compound.

In the same year, 1893, there was brought to me a good sample of grayish white, stratified mineral substance, said to be kaolinite and to have been taken from an immense deposit of a similar character east of Green River and in northwestern Colorado. This so-called 'kaolinite' proved upon examination to be similar volcanic dust, which had been subjected to the action of water mixed with clay, deposited in layers under the water, and afterwards hardened.

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#### VOLCANIC DUST IN TEXAS.

UNDER the above title Mr. H. W. Turner contributes an article to *SCIENCE* of April 26, 1895, briefly describing a specimen from the Llano Estacado region. Some of the previous notices of this or similar material are noted below.

The first specimen of the material which came under my notice was received by the Texas Survey in February, 1890, with other material forwarded by Professor W. F. Cummins. It was collected from the beds to which he gave the name 'Blanco Canyon' from the place of their most characteristic development, and in his first de-

scription of them\* he calls it chalk. Later, microscopic slides of this material were prepared in the Survey laboratory, by Mr. J. S. Stone, under the direction of Professor R. T. Hill, and these exhibited a large number of very finely preserved diatoms.

These diatoms were partially identified by Mr. C. H. Kain and published by Prof. Cope in his first notice of the probable Pliocene age of the Blanco Canyon beds.†

The diatomaceous character of this material was further noted by Messrs. Lewis Woolman and C. Henry Kain, and list of species given in *The American Naturalist* for 1892, p. 505, under the title 'Fresh-Water Diatomaceous Deposit from Staked Plains, Texas.'

In 1892 an examination of this material by the writer showed the presence of volcanic dust, but the diatoms constituted by far the greater part of the mass examined, and it was therefore classed with other materials of a similar kind from the coast region as diatomaceous earth, and only those siliceous deposits of like character which failed to reveal diatoms were classed as volcanic dust and briefly described in the Transactions of the Texas Academy of Science.‡ Further reference to these siliceous deposits are also made by Kennedy in the Fourth Annual Report Geol. Sur. Texas, pp. 20, etc.

The stratigraphic position of the deposit referred to by Mr. Turner has been accurately determined, as will be seen by reference to the different reports of Professor Cummins on northwest Texas and the Llano Estacado. The hill mentioned, on Duck Creek, in Dickens county, is in the type locality of the Blanco Canyon beds, and sections are given of it in the first three

\* First Ann. Rep. Geol. Sur. Texas, p. 190.

† Proc. Amer. Phil. Soc., 1892, p. 123.

‡ Vol. I., Part I., 1892. P. 33. 'Volcanic Dust in Texas.'